

New Orbit of 9 Argûs, β 101. By Professor S. Glasenapp.

(Communicated by T. Lewis.)

In the article "Orbit of 9 Argûs, β 101," published in vol. lii. No. 8 of the *Monthly Notices of the Royal Astronomical Society*, I have communicated the elements of this close double star. These elements present a fairly good agreement with the observations, especially for the angles of position, but in the distances the last observation ($0''.22$) gives a discordance of $0''.16$ with the calculated distance, which is $0''.38$.

This circumstance was mentioned by Mr. S. W. Burnham, M.A., in an article published in the journal *Astronomy and Astrophysics*, No. 116; where, supposing that the position of the satellite for the year 1875 must be changed as follows—

instead of $1875.71 \theta = 289^{\circ}.7 \rho = 0''.46$
it must be $1875.27 \theta = 289^{\circ}.7 \rho = 0''.58$

he draws another ellipse with a larger eccentricity. I admit that these corrections made by Mr. Burnham are very probable. If we adopt them, and take his apparent ellipse, we obtain a new set of elements; if, then, we determine their corrections by the method of least squares, we obtain the following most probable elements of 9 Argûs:—

$$\begin{array}{ll} T = 1892.27 & \lambda = 73^{\circ}.70 \\ P = 23.33 \text{ years} & i = 77^{\circ}.73 \\ n = +15^{\circ}.430 & e = 0.668 (\phi = 41^{\circ}.943) \\ \Omega = 97^{\circ}.54 & a = 0''.60 \end{array}$$

I give in the next table the comparison of these elements with the observations (see the above-mentioned note in the M.N.):—

t	θ_0	θ_c	$\theta_0 - \theta_c$	ρ_0	ρ_c	$\rho_0 - \rho_c$
1875 24	289 ⁰ .7	290 ⁰ .0	-0 ⁰ .3	0''.58	0''.58	0''.00
78.50	302.2	300.0	+2.2	0.45	0.48	-0.03
79.68	306.2	305.1	+1.1	0.38	0.42	-0.04
82.21	319.7	323.4	-3.7	0.35	0.29	+0.06
83.11	336.2	334.6	+1.6	0.30	0.24	+0.06
89.08	76.4	76.0	+0.4	0.34	0.32	+0.02
90.22	83.8	84.7	-0.9	0.34	0.35	-0.01
91.06	91.5	90.6	+0.9	0.34	0.34	0
92.05	98.7	100.1	-1.4	0.22	0.25	-0.03

The sum of the squares of the residuals is largely reduced; indeed, for our first set of elements it was 52.31 for θ and 0.0342 for ρ . For the new elements we have 26.13 for θ and 0.0111 for ρ .

In both angle and distance the sum of the squares has diminished very considerably. Therefore the new system of elements must be considered as representing much better the true orbit of γ *Argus*.

With these new elements the following positions of the satellite for several years have been calculated:—

	θ	ρ	t	θ	ρ
1894.0	273.8	0.32	97.0	285.9	0.57
95.0	279.6	0.46	98.0	288.5	0.58
96.0	283.1	0.54	99.0	291.1	0.57

The angular velocity is increasing, and between 1892 and 1894 the angle of position has changed 180° ; therefore each observation obtained during the present and next years will be of great value for the investigation of the orbit; but γ *Argus* belongs to the most difficult double stars, and is accessible only to the most powerful telescopes placed in perfect conditions.

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Observatory of the Imperial University :
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On the Proper Motion of Stars in the Dumbbell Nebula. By
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Most photographs of the Dumbbell Nebula in *Vulpecula* (M. 27, N.G.C. 6853) represent the brighter portion of it as being of a sort of hour-glass form or approximately the figure which would be formed by two opposite sectors of a circle of about 60° each. The stars, too, which are found in the nebula are not distributed wholly without relation to the form of the latter, for it is a remarkable fact that exactly at the common centre of the two sectors, or the neck of the hour-glass, a comparatively conspicuous star is placed, while the extremities of each of the bounding arcs are approximately indicated by stellar points. These stars are respectively *d*, *a*, *m*, *o*, and *c* in the figure.

In the *Philosophical Transactions of the Royal Society*, Vol. 151, Part III., the Earl of Rosse publishes a note on the positions of twenty-six stars as determined at the Poulkova

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